

## Catalogue of American Amphibians and Reptiles.

Lovich, J.E. and J.R. Ennen. 2014. *Graptemys gibbonsi*.

***Graptemys gibbonsi* Lovich and McCoy**  
**Pascagoula Map Turtle**

*Graptemys gibbonsi* Lovich and McCoy, 1992:293 (in part). Type-locality, "Chickasawhay River, Leakesville, Greene County, Mississippi, USA." Holotype, Carnegie Museum 94979, adult male, collected by R. C. Vogt, M. Pappas, and P. S. Freed on 21 July 1978.

*Graptemys pulchra gibbonsi*: Artner, 2003:ix and Artner, 2008:22 (both in part).

*Graptemys gibbousi*: Obst, 2003:16 (in part) *Ex errore*.

*G.[raptemys] gibbonsi*: Lee, 2009:645. *Ex errore*.

**CONTENT.** No subspecies are recognized.

**DEFINITION.** The Pascagoula Map Turtle, *Graptemys gibbonsi*, is a large riverine species that exhibits pronounced sexual dimorphism, where females attain a maximum carapace length (CL) of 295 mm and males a maximum of 141 mm (Lovich et al. 2009). Mean adult female CL (248 mm) can be well over twice the mean CL of adult males (104 mm; Gibbons and Lovich 1990, Lovich et al. 2009). In addition, females have conspicuously enlarged heads (37.9 mm, SD = 14.0 mm) with broad alveolar surfaces (12.1 mm, SD = 4.9) compared to males (head width – 16.4 mm, SD = 1.1 mm; alveolar width – 4.3 mm, SD = 0.40 mm; Lindeman, unpublished data). Males have longer tails with the vent posterior to the edge of the carapace. Both sexes have relatively flat plastrons. Similar to other species within the *pulchra* clade, *Graptemys gibbonsi* possess a high-domed shell with a median keel. The median carapace keel is composed of prominent spines on the posterior portions of the second and

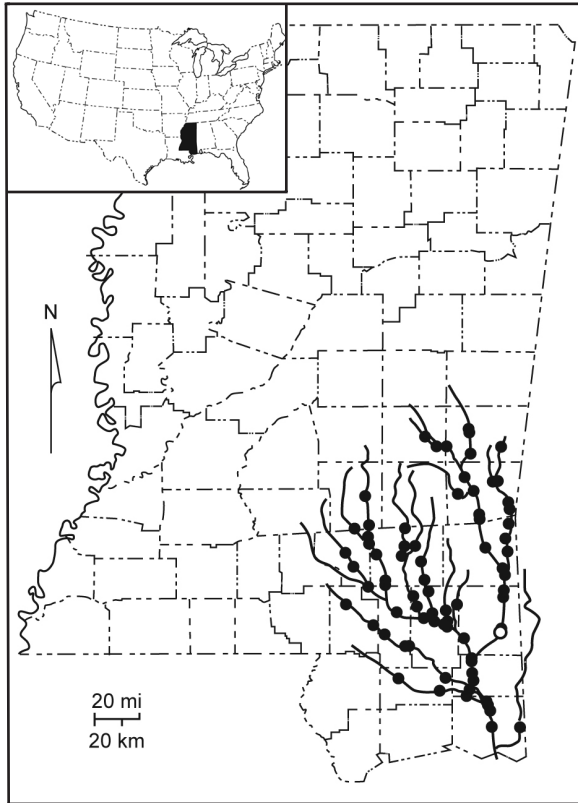


**FIGURE 1.** A male *Graptemys gibbonsi* from the Chickasawhay River in Greene County, Mississippi. Photo by Jeff Lovich.

third vertebrals. A broken black stripe, most pronounced anteriorly, marks the median keel of the vertebrals, and pleural scutes 1–3 have a network of intersecting yellow lines or circular yellow markings on the distal parts. The plastron is pale yellow with dark pigment on some seams. Ground color of the head and limbs is brown to olive with light yellow or yellowish-green stripes and blotches. The yellow pigment on the upper marginal scutes is wide in comparison to other members of the *pulchra* clade.

Hatchling pigmentation patterns resemble those of adults, but with more conspicuous patterns on the pleural scutes. Similarly, the plastron of hatchlings commonly has more dark pigmentation along the seams than adults. The shell is highly serrated along the edge of the carapace and the vertebral keel is more pronounced than in adults.

**DIAGNOSIS.** Key diagnostic features that distinguish individual species within the *pulchra* clade include presence/absence of a connection between the interorbital and postorbital blotches, nasal trident, supraoccipital spots, and curved or transverse chin bar. The head pattern of *G. gibbonsi* consists of a large interorbital blotch that is connected to large postorbital blotches on either side of the head, a feature common in *G. barbouri*, *G. pulchra* and *G. pearlensis*



**MAP 1.** The open circle marks the type-locality for *Graptemys gibbonsi*. Other selected localities are from Lindeman (2013).

but not *G. ernsti*. A three-pronged yellow blotch (nasal trident) is usually present on the dorsal head surface behind the nares, a more common feature in *G. ernsti* and *G. pearlensis* but not *G. pulchra* or *G. barbouri*. *Graptemys gibbonsi* does not possess supraoccipital spots or a curved/transverse chin bar, which are features unique to *G. ernsti* and *G. barbouri*, respectively. Additionally, the dorsal paramedian neck stripes are not expanded anteriorly as they are in many *G. ernsti*. Key features distinguishing *G. gibbonsi* from its sister taxa, *G. pearlensis*, are a wider vertical yellow bar with concentric secondary rings of yellow pigmentation on the dorsal surface of each marginal scute, narrow black bars on the ventral surface of each marginal scute, an incomplete black/brown stripe along the median keel, and vertical yellow pigmentation bars on the 12<sup>th</sup> marginal scutes greater than 50% of the scute length (Ennen et al. 2010a).

#### PHYLOGENETIC RELATIONSHIPS.

Phylogenetic relationships within the genus *Graptemys* have been the focus of several studies (Lamb et al. 1994, Stephens and Wiens 2003, Wiens et al. 2010) but more are needed. Historically, species descriptions were based largely on pronounced morphological or pattern differences among species that supported a general pattern of drainage-specific endemism in Gulf Coast taxa. However, morphological differences often were not supported by molecular data because of the shallow lineages within *Graptemys*. This incongruence between morphology and molecular data has contributed to taxonomic uncertainties and poor phylogenetic resolution within the genus (see Ennen et al. 2010b). Additionally, discordance between mitochondrial and nuclear gene phylogenies only added to obfuscation of phylogenetic relationships within the genus, both at the species and clade level (Wiens et al. 2010). Using only mtDNA, Lamb et al. (1994) reported three distinct clades, *pulchra*, *pseudogeographica*, and *geographica*. However, nucDNA only resolved two clades, a sawback clade (*G. flavimaculata*, *G. oculifera*, and *G. nigrinoda*) and a Texas endemic clade (*G. versa* and *G. caglei*), and failed to provide support for a basal *geographica* clade and *pulchra* clade supported by mtDNA (Lamb et al. 1994, Wiens et al. 2010). A combined analysis by Wiens et al. (2010) using mtDNA and nucDNA data produced a phylogenetic topology similar to that of Lamb et al (1994).

The phylogenetic relationships within the *pulchra* clade, which includes *G. pulchra*, *G. barbouri*, *G. ernsti*, *G. gibbonsi*, and *G. pearlensis*, were poorly supported and topologies were mostly polytomies (Ennen et al. 2010a, Lamb et al. 1994), thus making inferences about relationships among the five species difficult. Although resolution above the species level were weak, the mtDNA data from Ennen et al. (2010a) provided strong support at the species level, including support for the recently described species, *G.*

*pearlensis*, and support for *G. gibbonsi* being its sister taxon. To date, Ennen et al. (2010a) is the only study to include all five species within the *pulchra* clade (including *G. gibbonsi*) in a molecular analysis.

**PUBLISHED DESCRIPTIONS.** Composite modern descriptions are given in Bonin et al. (2006), Ernst et al. (1994), Ernst and Lovich (2009), Lovich and McCoy (1992, 1994), and Lovich et al. (2009). However, these latter descriptions were clouded by the fact that *G. gibbonsi*, as recognized at the time, also included the yet undescribed *G. pearlensis* from the Pearl River (Ennen et al. 2010a). Detailed descriptions of the differences between the two species are given in Ennen et al. (2010a) and Lindeman (2013).

**ILLUSTRATIONS.** **Color photographs and illustrations** of *Graptemys gibbonsi* are found in Ashton and Ashton (1985), Dundee and Rossman (1989), Ennen et al. (2010a), Ernst and Barbour (1972), Ernst and Lovich (2009), Ernst et al. (1994), Lovich et al. (2009), Mara (1996), Lindeman (2013) and Vetter (2004). **Black and white photographs and illustrations** are found in Ernst and Barbour (1972, 1989), Ernst et al. (1994), Lovich and McCoy (1994), Powell et al. (1998, 2012), Lindeman (2013) and Wahlquist (1970).

**DISTRIBUTION.** *Graptemys gibbonsi* is found in large rivers to medium-sized creeks in the Pascagoula River system, Mississippi (Lovich and McCoy 1994). The species is found in the Pascagoula, Leaf, and Chickasawhay rivers, Red, Bowie, and Okatoma creeks (Cliburn 1971); Chunky River, Black, and Tallahala creeks (Lindeman, 1998); Bogue Homa, Bucatunna, Long, Gaines, Oakohay, Okatibbee, Souinlove, Tallahoma, and Thompson creeks (Selman and Qualls 2009). *Graptemys gibbonsi* is present at a single location in the lower reaches of the Escatawpa River, but absent from the upper portion of the Escatawpa River in Mississippi (Selman

and Qualls 2009) and Alabama (Mount 1975). Likewise, the species is absent from Big Creek (Mount 1975) and Bluff Creek (Selman and Qualls 2009). For additional information on distribution for *G. gibbonsi* within the Pascagoula River drainage see Selman and Qualls (2009) and Lindeman (2013).

**FOSSIL RECORD.** None. However, Ehret and Bourque (2011) described *G. kernerii*, from fossils found in the Suwannee River drainage of north-central Florida. *G. kernerii* is in the *pulchra* clade but is more similar to *G. barbouri* than others in the clade.

**PERTINENT LITERATURE.** Prior to the description of *Graptemys gibbonsi* (Lovich and McCoy 1992) as a separate species, literature pertaining to the species was considered part of that belonging to *Graptemys pulchra* as summarized by Lovich (1985). However, this literature is clouded by the fact that the pertinent literature for *G. gibbonsi* included *Graptemys pearlensis*, a recently described species from the Pearl River. Literature pertaining to turtles now recognized as or suspected to be *Graptemys gibbonsi* is listed by topic: **scute morphology** (Ennen et al. 2010a, Little 1973, Lovich and Ernst 1989, and Tinkle 1962), **natural history data on reproduction, diet, habitat, behavior, and conservation** (Bickham et al. 2007, Buhlmann and Gibbons 1997, Buhlmann et al. 2008, 2009, Cheung and Dudgeon 2006, Ennen et al. 2007, Ernst and Lovich 2009, Lee 2012, Lindeman 1998, 1999, 2000, 2013, Lindeman and Sharkey 2001, Lovich and Ennen 2013, Lovich et al. 2009, Moll and Moll 2004, Reed and Gibbons 2003, Selman and Qualls 2008a, 2008b, Selman et al. 2008, Selman 2012, and United States Fish and Wildlife Service 2005), **geographic distribution** (Cliburn 1971, Iverson 1992, Lindeman 1998, Lovich et al. 2009, and Selman and Qualls 2009), **sexual size dimorphism** (Gibbons and Lovich 1990, Lindeman 2008, and Lovich et al. 2009), **systematics and taxonomy** (Ennen

et al. 2010a, 2010b, Fritz and Havaš 2007, Lamb et al. 1994 [although the latter did not analyze samples of *G. gibbonsi* (*sensu stricto*)], Lindeman (2013), Lovich and McCoy 1992, McDowell 1964, McKown 1972, Rhodin et al. 2008, 2009, 2010, van Dijk et al. 2011, 2012, 2014, and Wiens et al. 2010), **hematology** (Perpinán et al. 2008), and **zoogeography and biogeography** (Stephens and Wiens 2003, 2004, 2009, Walker and Avise 1998). The species was included in a key of U. S. and Canadian herpetofauna (Powell et al. 2012).

**ETYMOLOGY.** The specific epithet *gibbonsi* is a patronym honoring Dr. J. Whitfield Gibbons of the University of Georgia, Savannah River Ecology Laboratory.

**COMMENT.** Broad-headed map turtles in the Pascagoula River were formerly thought to belong to the species *G. pulchra* (Cagle 1952). These turtles were later described as the “Pascagoula Map Turtle,” *G. gibbonsi* (*sensu lato*), by Lovich and McCoy (1992), who demonstrated that the species *Graptemys pulchra* Baur (1893:675) was actually a composite of three distinct, allopatric species. Lovich and McCoy (1994) summarized the literature under that arrangement. More recently, Ennen et al. (2010a) described differences between the Pearl and Pascagoula River populations of broad-headed *Graptemys* based on pattern, morphology and genetics. Their analyses demonstrated that *G. gibbonsi* (*sensu lato*), as originally described by Lovich and McCoy (1992), was also a composite consisting of two distinct, allopatric species. With the recognition of the Pearl River turtles as a distinct species (*G. pearlensis*; Ennen et al. 2010a), *Graptemys gibbonsi* is now restricted to the Pascagoula River drainage.

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